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Allan Moluf

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EXAMINER

BARON, HENRY

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/996,102	<b>Applicant(s)</b> MOLUF, ALLAN	
	<b>Examiner</b> HENRY BARON	<b>Art Unit</b> 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### ***Detailed Action***

#### ***Response to Arguments/Remarks***

1. Claims 1 – 8 are pending in the application with claims 1 and 5 amended.
2. Applicant's arguments filed 04/14/2008 have been fully considered but they are not persuasive.
3. Applicant argues that the rejection of amended claims 1 – 8 lacks a prima facie case of obviousness because neither Gringeri nor Tsai teaches the required limitations; in particular, Applicant argues, the cited references do not teach of combining video frames from each input data stream to form a composite video frame for the output data stream and rescheduling part of a given video frame in a given individual input stream so that the part is scheduled in an earlier frame in the interleaved output stream than the composite video frame, when the given input video frame is larger than a threshold size.
4. Examiner replies that Gringeri teaches of a method for multiplexing compressed video input data streams and a multiplexer for combining the compressed video input data streams into an output data stream where each input data stream divided into video frames by receiving multiple input data streams; providing an input buffer capable of holding at least a maximum-size video frame for each of the input data stream as presented in the citation below. Tsai is chosen to complement Gringeri by teaching a method for multiplexing compressed video input data streams where a video frame is larger than a threshold size by dividing the frame into at least a first and second part and rescheduling at least one part of the given video frame for transmission in the output data stream earlier than the corresponding frame time in the output data stream. The rationale to make an obvious combination of these references is embodied in Tsai '552 Figure 1 where it is illustrated that frames exceed a threshold (element 14) in some time slots (1, 5, and 6) 'the problem' and in Figure 2 where above threshold frames are rescheduled to excess capacity timeslots both forward ( frames 1 to 2; 6 to 7) and backward, sic earlier, (frame 5 to 4) in time – thus in effect smoothing the bandwidth distribution.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

a. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1 – 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gringeri (U.S. Patent 6108382) in view of Tsai, et al (U.S. Patent 6,529,552).

7. In consideration of claims 1 and 5, Gringeri teaches of a method for multiplexing compressed video input data streams and a multiplexer for combining a plurality of compressed video input data streams into an output data stream, each input data stream divided into video frames, into an output data stream with low latency, the method comprised of (a) receiving a plurality of input data streams (Figure 1 elements 100 and 102) (b) combining a corresponding video frame from each input data stream to form a corresponding video frame for the output data stream (Figure 1 input streams 105 and 104; output streams 115) and (d) transmitting the output data stream. (Figure 1 output stream 125) Also (4: [0050+] read an ATM network can efficiently allocate network bandwidth and switch buffer space to a number of variable bit rate video streams. By maximizing the utilization of the allocated network bandwidth and switch buffer space, the network can statistically multiplex a larger number of variables bit rate video streams over VBR connections for the same video quality.)

8. However Gringeri is silent with regards to disclosing (c) for each input data stream, when a given video frame from the input data stream is larger than a threshold size, dividing the given video frame into at least a first part and a second part and rescheduling at least one part of the given video frame for transmission in a specified output data stream video frame, where the specified output data stream video frame is scheduled for transmission earlier than the video frame in the output data stream corresponding to the given video frame from the input data stream.

Art Unit: 2616

9. Tsai teaches this limitation; (Figure 2; dividing the given video frame into at least a first part and a second part (4: [0014] read [a] bit budget per frame 14 may be illustrated that may be constant in a constant capacity network. Examiner notes that bit budget per frame element 14 is a threshold size, dividing the given video frame into at least a first part and a second part; 5: [0010] read FIG. 2 illustrates the same series of coded bits re-distributed over the same frames 18a-18g in time as shown in FIG. 1. The re-distribution considers utilizing skipped frames in the variable rate bitstream to place bits from neighboring frames into the bitstream prior to or otherwise adjacent to their actual decode times. This method may be used with storage and delivery of content which has been encoded off-line. The information may be stored in the bitstream in such a way that it can be delivered and decoded over a constant bit-rate channel with constant quality. This capability may come from the storage of some bits generated from future frames being stored in special user-defined data fields in prior or otherwise adjacent frames. For example, in FIG. 2, excess bits 20 associated with Frame 5 (18e) are shown with bits 16d tagged from Frame 4 (18d). Therefore, the excess bits 20 representing the frame at time  $t+1$  (where, for example,  $t=\text{Frame 4 (18e)}$ ), may be transmitted along with the bits 16d associated with the frame at time  $t$  (Frame 4 (18d)) because excess bandwidth may be available for transmission for that frame.)

10. It would have been obvious at the time the invention was made by a person of to having ordinary skill in the art to modify the compressed video multiplexing data streams teachings of Gringeri with the rescheduled frame transmission teachings of Tsai.

11. With such a modification, the transmit channel can be optimally used by redistributing bits from over to under utilized frame slots, allowing the stream to be transmitted with low latency.

12. In consideration of claims 2 and 6, Gringeri teaches of a method for multiplexing compressed video input data streams, each input data stream divided into video frames, into an output data stream with low latency but does not teach of a predetermined threshold size.

Art Unit: 2616

13. Tsai teaches a method where the threshold size is predetermined. (Figure 2 and 5: [0008] read [a] bit budget per frame 14 i.e. threshold, may be illustrated that may be constant in a constant capacity network.).

14. It would have been obvious at the time the invention was made by a person of to having ordinary skill in the art to modify the compressed video multiplexing data streams teachings of Gringeri with the predetermined threshold size teachings of Tsai.

15. With this modification, once a video frame size exceeds a predetermined threshold, it can be partitioned into parts and parts can be rescheduled for transmission with an earlier, smaller video frame. In this manner, the bursts of large video frames are regulated by redistribution allowing the full channel capacity to be used effectively.

16. In consideration of claims 3 and 7, Gringeri teaches of a method for multiplexing compressed video input data streams, each input data stream divided into video frames, into an output data stream with low latency but does not teach of a adaptively determining the threshold size.

17. Tsai teaches a method where the threshold size is adaptively determined. (Figure 4 and 6:[0015] read [a]s illustrated in FIG. 4, a flowchart 70 of a method for managing bit expenditures associated with a digitally compressed video bitstream for variable capacity networks may be provided. The method may include a step 72 that may analyze users requested quality of service (QoS) including temporal and spatial visual quality measures, network capacity and availability, enhanced feature compliance, such as, for example, scalability, and number of users supported by the network. A step 74 may manage the temporal frame rate of a coded video sequence based on the users' requested temporal QoS, network capacity and availability, and the enhanced feature compliance and number of users supported by the network. Next, a step 76 may change the quantization of the residual frames i.e. adaptive threshold, based on the users, requested spatial QoS, network capacity and availability, and the enhanced feature compliance and number of users supported by the network.).

Art Unit: 2616

18. It would have been obvious at the time the invention was made by a person of to having ordinary skill in the art to modify the compressed video multiplexing data streams teachings of Gringeri with the adaptive threshold size teachings of Tsai.

19. With this modification, once a video frame size exceeds an adaptively determined threshold, it can be partitioned into parts and parts can be rescheduled for transmission with an earlier, smaller video frame. In this manner, the bursts of large video frames are regulated by redistribution allowing the full channel capacity to be used effectively. By adaptively determining the threshold the channel loading can be matched with the bandwidth.

20. With regards to claims 4 and 8, Gringeri teaches wherein at least one of the input data streams is an MPEG-encoded video stream; (Abstract read [a] method and system for transmitting a video stream in an asynchronous transfer mode (ATM) network comprises steps of encoding the video into an MPEG-2 variable bit rate video stream, shaping the encoded variable bit rate video stream to conform to the traffic contract parameters for a Variable Bit Rate (VBR) connection in the network, and transmitting the shaped variable bit rate video stream on the VBR connection based on the traffic contract parameters..)

#### ***FINAL ACTION***

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

22. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2616

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Conclusion***

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henry Baron whose telephone number is (571) 270-1748. The examiner can normally be reached on 7:30 AM to 5:00 PM E.S.T. Monday to Friday.

24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. B./  
Examiner, Art Unit 2616  
HB

/Seema S. Rao/

Supervisory Patent Examiner, Art Unit 2616